

REMARKS

This paper is being provided in response to the Office Action mailed June 30, 2005, for the above-referenced application. In this response, Applicants have cancelled withdrawn claims 9-11 without prejudice or disclaimer of the subject matter thereof and added new claims 12-19 to clarify that which Applicants consider to be the invention. Applicants respectfully submit that the new claims are fully supported by the originally-filed specification.

Applicants gratefully acknowledge the indication of allowable subject matter in claims 2-4 and 6-8.

The rejection of claims 1 and 5 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,340,435 to Bjorkman et al. (hereinafter "Bjorkman") is hereby traversed and reconsideration is respectfully requested.

Independent claim 1 recites a semiconductor device having a semiconductor substrate. A metal film is disposed on the semiconductor substrate. A diffusion barrier film covers an upper surface of the metal film and includes an insulating material containing silicon, carbon, hydrogen and nitrogen as constituent elements and contains Si-H bond, Si-C bond and methylene bond. Claim 5 depends from independent claim 1.

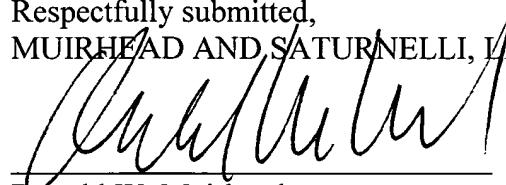
The Bjorkman reference discloses an integrated low k dielectric and etch stop. The Office Action cites col. 5, lines 47-51 of Bjorkman as disclosing a dielectric layer containing silicon, oxygen, carbon and hydrogen and which includes Si-C bonds and C-H bonds.

Applicants' independent claim 1 recites a semiconductor device having at least the features of a diffusion barrier film covering an upper surface of the metal film, where the diffusion barrier film includes an insulating material containing silicon, carbon, hydrogen and nitrogen as constituent elements, and where the insulating material contains Si-H bond, Si-C bond and methylene bond (-CH₂-). Applicants have found that a semiconductor device configuration as claimed provides for improved interlayer adhesiveness of the diffusion barrier film while maintaining the lower dielectric constant of the diffusion barrier film. See, for example, page 5 beginning at line 22, which indicates that a diffusion barrier film according to the present invention contains a methylene bond that provides improved resistance to the ashing processing that is conducted in the resist stripping process.

Applicants respectfully submit that the Bjorkman reference does not teach or fairly suggest at least the above-noted features as claimed by Applicants. Specifically, Bjorkman does not show, teach, or suggest insulating material of a diffusion barrier film that contains methylene bonds as is claimed by Applicants. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

Respectfully submitted,
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